

Mountain Computer
INCORPORATED

Product Catalog

November 1981



Mountain™ Computer

INCORPORATED

Located In the Santa Cruz Mountains of Northern California, Mountain Computer, Inc. Is a computer peripheral manufacturer dedicated to the production of user-oriented high technology products for the microcomputer.



300 EL PUEBLO, SCOTTS VALLEY, CALIFORNIA 95066 (408) 438-6650 TWX: 910 598-4504

Three cards in One!

The Mountain Computer CPS Multifunction card provides all the capabilities of a serial interface, parallel output interface and real-time clock/calendar—all on one card—occupying only one slot in your Apple II®. Serial and parallel output may be used simultaneously from CPS.

For growing or changing business systems, it's the best single card you can start with. Great flexibility at an unbeatable price of \$239. plus cables.



CPS MultiFunction

Features

CPS is configured from a setup program on diskette which sets the parameters (such as baud rate, line feed, printer commands, etc.) for all functions contained on the card. Once you have configured your card, the information is stored in CMOS RAM and need not be set up again. You may also change parameters from the keyboard with control commands. All function set-ups are stored on-board by battery power for up to two years. "Phantom Slot" capability permits assigning each of the functions of the CPS to different slots in your Apple without the card actually being in those slots! For example, insert CPS in slot #4 and set it up so that it simulates a parallel interface in slot #1 and a clock in slot #7 and leave the serial port assigned to slot #4. CPS's on-board intelligence lets it function in a wide variety of configurations, thereby providing software compatibility with most existing programs.

Calendar/Clock

The Calendar/Clock allows timing increments from 1 second to 99 years and is battery backed up for two years. Two AA standard alkaline batteries are provided for backup. Applicable to all real-time situations, but does not support interrupts.

Parallel Output

Parallel output features auto-line feed, Apple tabbing, line length, delay after carriage return, lower to upper case conversions, and more. The Centronics standard is used, though it can be reconfigured to other standards such as, IDS, Qume, Diablo, and of course, Epson, to name just a few. Status bit handshaking is also definable.

Serial Interface

Serial interface features auto-line feed, transparent terminal mode, Apple tabbing, line length, delay after carriage return, local echo of output characters, simultaneous serial/parallel output, lower to upper case conversions, discarding of extraneous LFs from serial inputs. Serial interface makes use of the powerful 2651 Serial PCI chip. Further, the serial interface has 16 selectable internal baud rates from 50 to 19.2 Kbaud, allowing you a wide variety and speed of transmission. Half/Full duplex terminal operations are also possible using the CPS card. I/O interface conforms to RS-232C for hookup of serial devices using those formats. Asynchronous and synchronous operations are possible, though some user modifications may be required.

Applications are numerous. Connecting a parallel printer? Epson, Centronics, IDS, Paper Tiger and others are all handled with ease. Connecting a serial printer, such as Qume, Diablo, NEC, TI-800 Series, can all be handled via the CPS cards. Connecting a modem? Once again, the CPS card is the solution. Hayes Smart Modems, Novation CAT Modems, M & R Pennywhistle—all are compatible with the CPS in both full/half duplex, selectable baud rates, and even in transparent terminal mode.

Applications requiring real-time and date information, including day of week, day, month, year or hours, minutes, and seconds for applications requiring a real-time standard are available. Ready-made cables are also available and recommended with any connection you may need for your CPS card. Connect with your Apple dealer and see how the CPS MultiFunction card provides the most comprehensive capabilities for RS-232C serial interface, parallel output, and real-time calendar/clock of any card available today—all on one card—at one low price.

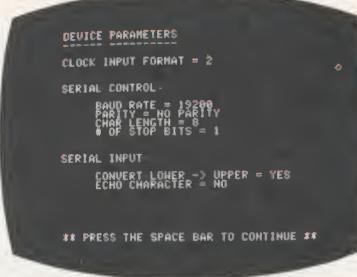
For cable information see page 15.



CPS real-time clock.



CPS set-up program, parallel device parameters.



Set-up program, serial device input setup.

Specifications

Real-Time Clock/Calendar

- One second to 99 years.
- Crystal controlled.
- Battery backed-up (2 years).
- Two AA standard alkaline batteries for backup (provided).
- Provides seconds, minutes, hours, day of week, day of month, month, year in string format.
- Leap year is automatically handled.
- 24-hour military format or 12-hour with AM/PM format.
- ± .001% accuracy.

Parallel Interface

- Parallel functions permit the selection of the following features: auto-line feed, Apple tabbing, line length, delay after carriage return, lower to upper case conversion.
- PARALLEL OUTPUT PORT**
- a) Centronics standard—reconfigurable to other standards
 - b) 8 data lines
 - c) ± strobe out jumper option
 - d) ± acknowledge jumper option
 - e) supports Apple parallel printer cables
 - f) status bit handshaking

Serial Interface

- Serial functions permit the selection of the following features: auto-line feed, terminal mode, Apple tabbing, line length, delay after carriage return, local echo of output characters, simultaneous serial/parallel output, lower to upper case conversion, discarding of extraneous LFs from serial input.
- Uses the powerful 2651 serial PCI* chip.
- 16 selectable internal baud rates: 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19200.
- On-board jack for output of selected baud rate to external device.
- On-board jack for input of baud rates generated by external device (DC to .8M baud).
- Half/Full duplex terminal operation.
- 5-8 bit character selection.
- Odd, even, or no parity selection.
- I/O interface conforms to RS-232C
 - a) DTR, DSR, CTS, RTS, DCD, TXD, RXD
 - b) protective ground signal
- Supports MCI 26-pin flat cable to DB-25 type connector

RS-232 SERIAL PORT—Asynchronous/Synchronous Operation

Asynchronous Features

- a) 1, 1½, 2 stop bit format
 - b) false start bit detection
- Synchronous Features**
- a) 1 or 2 synchronous characters
 - b) transparent or nontransparent mode
 - c) autosync or DLE-sync insertion
 - d) sync or DLE stripping

*Programmable Communication Interface

Control ROM

- Control programs in the ROM reside in 240 byte "banks" and are executed in the \$CN00 space when needed and therefore do not conflict with control programs of most other peripherals which typically occupy the \$C800 space.
- ROM-based software (onboard)

to:

- *permit switching of input/output devices
- *enable/disable I/O slot selection (phantom slots)
- *permit commands sequences to be sent from keyboard or from programs to change parameters

Software Provided on Diskette

- A diskette containing the "SETUP" Program is provided which defines all the parameters of the CPS Card. This program also permits "SAVING" parameters setups as TEXT files for quick access in the event the user has requirements for many different configurations. Program

operates immediately as parameter choices are made or when a named TEXT file is "LOADed".

- Printer-Clock Demo Program (Applesoft program lister which includes date, time and page numbering, as well as program indentation).

Applications

- Timed Reports and Communications
- Standard Parallel Output
- Hi-speed Serial Input/Output
- Communications Interfacing

- Analog and Digital Clock
- Intelligent Interface
- Terminal Emulator
- Logical Peripheral Expansion
- Intelligent Program Lister

Dual Ram Power!

Now you can expand the available memory on your Apple II® to 80K by using this dual 16K RAM card. RAMPLUS+ has two banks of 16K selectable RAM. Hardware and/or software selection of each 16K bank of RAM is controlled by the user.

Provides all Apple Language Card® functions plus an additional 16K RAM.



Ramplus +

Features and Specifications

Card installation is simple, just install it in any I/O slot. No bothersome cables to connect or IC's to remove from the Apple motherboard. When RAMPLUS+ is in Slot 0, it emulates an Apple Language Card®, and you can install multiple RAMPLUS+ cards into the same Apple II®.

The card is supplied with 16K of installed RAM with an additional 16K of plug-in RAM available. RAM diagnostics have been developed (on diskette) and are supplied with the product.

This card is ideal for programmers since it provides detailed status for the previous state of the card. Status includes the area and bank of RAM selected, READ, READ or WRITE operation, and ROM Enable or Disable information.

Mountain Computer continues its tradition of expanded Apple user support by making RAMPLUS+ compatible with the Mountain Computer Expansion Chassis™.

Specifications

- Provides all Apple Language Card® functions.
- No cable—no chip removal/insertion—just plug it in
- Works as a language card in slot 0 or in the Mountain Computer Expansion Chassis™.
- Optional second 16K bank
- Second bank is software or manual selectable
- Uses standard 16K MOS RAMs (4116)
- Lower power drain on +12v DC than Apple Language Card (good for disc controllers)
- Status—provides previous state

of language card—WRITE enabled/WRITE protected, first or second 4K byte selected, ROM or RAM mode, first or second 16K bank selected.

- User can buy these to put into the spare RAM sockets:

Type—16K Dynamic—

AMD 9016CPS
Fairchild 4116-2DC
Motorola SCM90058C
ITT 4116-3N
National 5290N-4
Toshiba TMM416D-4
Siemens HYB4116-4
TI TM54116-25NL



Expand your Apple II® Peripheral Capacity.

Expansion Chassis™ gives you 8 more bank-selectable peripheral slots for your Apple II®. It allows you to access up to 15 peripheral cards. Expansion Chassis has a heavy-duty power supply that allows you to run a large number of peripherals without straining the power supply in the Apple.

Expansion Chassis

Features and Specifications

The Expansion Chassis is the answer to how to use the multitude of peripheral cards available for the Apple in the most professional manner.

Expansion Chassis allows you to do a complete demonstration on any Apple system without having to open the chassis and be pulling cards and replacing IC chips. It is probably the best tool for selling complete Apple systems ever devised.

For those who need more slot capabilities, the Expansion Chassis is, again, the solution. Expansion Chassis can provide a quieter, cleaner, more powerful bus connection for those high-performance cards. In addition, with the bank-selectable capabilities, a total of four Expansion Chassis can be hosted by one Apple II®. This means the additional capability of adding banks of RAM or ROM is possible for those using Apple-based systems on a larger scale. Expansion Chassis also provides you with a cooler environment than the host Apple II® computer.

The Expansion Chassis is compatible with Pascal, as well as Integer BASIC, Applesoft BASIC, and the monitor. It can be controlled via software, hardware, or a combi-

nation of both. It can be selected and/or deselected via software or by pressing the front panel SELECT/DESELECT button.

ate either the peripheral cards in the Apple or the cards in the Expansion Chassis by switching from one to the other.

- Select/Deselect Expansion Chassis with front panel switch or under software control—even from your programs. Front panel LED indicates "In Use" when selected.
- Expansion Chassis' power supply is independent of the Apple's.
- Expansion Chassis' power supply turns ON or OFF by sensing whether your Apple is ON or OFF. Front panel LED indicates "Power —ON/OFF."
- Language cards (Applesoft or Integer ROM Cards or Language Expansion Card) remain active in the Apple even when Expansion Chassis is selected.
- Physical dimensions: 14 $\frac{3}{4}$ "W x 6"H x 11 $\frac{1}{8}$ "D.
- Up to eight additional peripheral slots bank-selectable from your Apple. This means you can oper-

Specifications

Applications

Demonstration Device for
Dealers and Salespeople
Process Control Box
Expandable Peripheral Device
Tester for Peripherals
Development Device

Power for your Apple II®!

A board whose added features can turn the Apple II® computer into one of the most powerful personal computers available today. ROMPLUS+ provides 6 sockets to accept individually addressed 2K ROMs or EPROMs.



Diskette not included.

Romplus+

Features and Specifications

ROMPLUS+ offers 6 sockets for ROMs or EPROMs plus a "scratch pad" RAM and sophisticated firmware on ROMPLUS+ allows one, two, or more chips to be used simultaneously for the programs longer than 2K. ROMPLUS+ also allows you to add additional ROM memory by the use of additional boards. For expanded capability and magnitudes greater speed, the ROMPLUS+ is your key to system expansion.

Specifications

- Holds 6—2716 5 volt EPROMs or ROM equivalent. Each holds 2048 bytes.
- Each ROM resides in the Apple \$C800 space and any ROM may be turned on and used when desired.
- An on-board control ROM residing in the CN00 space is activated with a PR#N or IN#N from BASIC. It controls the 6 ROMs and handles communication between ROMs, including subroutine calls from one ROM to another which allows use of programs larger than 2K.

- 255 bytes of on-board RAM for scratch pad or data storage. It resides at CF00—CFFE. This RAM space is software selectable between this RAM and the top of any ROM you may select.

- Two TTL inputs are available for special control. One may be used with Keyboard Filter for "Shift Key" operation. The TTL Connector Cable is available for this connection. See product list, page 16.

- Compatible with CopyRom and Keyboard Filter Rom (sold separately) See page 16.

Applications

Generate ROM software for customer hardware interface.
Place often used utilities in ROM.
Create non-standard character sets.
Business and educational programs.
Process control software.
Graphics routines.
Programming aids.
Dedicated software systems without disk drives.

Available ROMS for Mountain Computer's Romplus+

SOFT CTRL SYSTEMS
Box 599
West Milford, NJ 07480

Applesoft Editrom
Disk Copy/Space ROM
BASICSROM
List CTRL in ROM
Commandrom
Applesoft Renumber/Mergerom
Double-Dos ROM

HIGHLANDS COMPUTER SERVICES
14422 S.E. 132nd
Renton, WA 98055

EPROM #1
EPROM #2
EPROM #3
MCAT 2.0
CRAE 2.0
Applesoft Editor

SYNERGISTIC SOFTWARE
5221 - 120th S.E.
Bellevue, WA 98006

Program Line Editor



Program Eproms with your Apple II®.

ROM based firmware permits a "power-up and go" configuration. Frequently used programs can now be installed on firmware by use of the RomWriter. By using ROM, it frees up RAM memory space for companion programs and there's never a need to be loaded from a disk. Add speed and ease of use to your system with programmable ROMs.

RomWriter*

Features and Specifications

Virtually foolproof programming. Specify a Start and End address in the EPROM and either a Disk File name or a starting address in memory. Desired code will be BURNed followed by a VERIFY. Additionally, existing EPROM code can be merged with desired changes to facilitate EPROM debugging. Easy data entry and high reliability are designed into the RomWriter. Programmed EPROMs can be RUN while residing on RomWriter or can be transferred to the Mountain Computer ROM-PLUS+ board.

For speed and reliability, programmed EPROMs are the answer you've been looking for, and now you have the capability of programming them yourself. You, yourself, can enhance the power of your Apple II® system by the use of EPROMs.



The PROM burner program, included with RomWriter.

Specifications

Hardware

- Programs 2716 EPROMs—5V, 2K.
- Installs in any peripheral slot (except #0).
- Zero insertion force socket (ZIF). Mechanical lever opens up pin holders to drop in an EPROM.
- On-board Bat Handle switch for power off the ZIF Socket permits EPROM to be Installed/Removed without power-down of computer.
- On-board DIP switch provides: Write Protect—provided to prevent accidental overwriting of EPROMs while RUNning from RomWriter. SCFFF-Off—provided to suppress execution of this command (which shuts off all peripherals in the Apple system when executed) while programming or later while RUNning.
- Programmed EPROMs can be RUN while residing on RomWriter board.
- Optimum voltage and current for trouble-free programming.
- Complete 2716 programmed in under 2 minutes (50 msec/byte).

Software

- Diskette furnished.
- Programs require Applesoft firmware.
- Programming procedure:
 - a. Specify a Start and End address in the EPROM.

- b. Specify a Disk File Name or
- c. Specify a Starting address in memory.

- Features provide screen-oriented editing during the procedure to enter memory parameters for the EPROM to be programmed.
- After the memory parameters have been entered, desired code will be BURNed followed by a VERIFY. If the EPROM does not VERIFY, prompts are provided for re-programming.
- Existing EPROM code can be merged with desired changes to facilitate EPROM debugging. This permits rapid incorporation of updated code from disk files without time-consuming reassembly.
- All or part of a 2716 EPROM may be programmed.
- Programmed EPROMs can be RUN on RomWriter.
- Programmed EPROMs can be RUN on ROMPLUS+.

Applications

- Product Emulator
- Software Development
- Operation Testing
- Software Drivers
- Energy Control
- Instrument Control
- Data Acquisition
- Software Security
- Special Handicap Subroutines

*RomWriter II will be available early 1982 and will program 2716, 2516, and 2732's.

The instrument anyone with an Apple II® can play.

MusicSystem sets new standards for computer-generated music. A digital synthesizer with 16 voices, stereo output, and polyphonic multi-voice chords—all via the Apple II®. This is a true music synthesizer, fully programmable for each voice it creates with instrument definitions and music dynamics. Frequency resolution in .5Hz steps, and even graphical input of sheet music using standard music notations.



MusicSystem

Features

MusicSystem is usable by anyone, with or without technical music or computer background. MusicSystem is a fun way to get involved in both computers and music education. It is a dynamic music theory teaching instrument, from basic elementary music theory to advanced harmonic concepts. Graphical music editing is simple using the light pen (provided), game paddles, or the keyboard. Pre-entered music is provided for immediate playing and enjoyment.

MusicSystem allows the user to enter and edit musical scores, create and modify instrument definitions, and combine the scores and instrument definitions into playable files for output to any stereo system.

MusicSystem has the ability to specify note frequency histories. Most synthesizers allow you to either specify the amplitude envelope or vary the waveform when the note is played. MusicSystem provides both these features. In addition, it has the ability to supply up to fifteen relative frequency changes during each note. This feature (controlled

by the user during the instrument definition process) may be used to produce vibrato or tonguing effects.

MusicSystem Software

MusicSystem contains four main programs: Music Editor, Instrument Definer, Music Merger, and Music Player.

System software is accessed via a series of nested menus (refer to the figure below). A menu item selection will result in either a direct action, or will display another menu.

of the screen provides a graphic display of a section of the music composition; the lower portion of the screen contains editor menu selections, command lines and status. The figure below displays the Music Editor main menu. Menu selections are controlled by game paddle or light pen (included with the MusicSystem). Three additional Editor graphic menus (subordinate to the main menu) are included.



MusicSystem Editor Program.

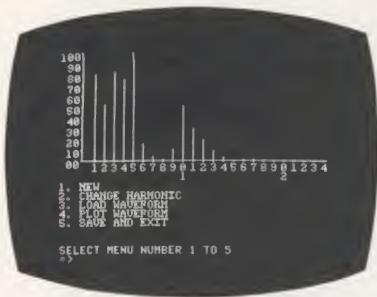
Music Editor divides the monitor into two areas: the upper two-thirds



MusicSystem main menu.

Instrument Definer provides the tools for creating and synthesizing a wide range of instruments (brass, percussion, woodwind and/or string). Each instrument definition is composed of one or more frequency sources, each with a definable wave-

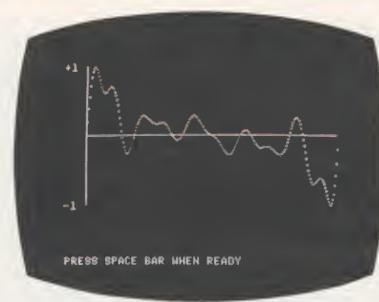
form, adjustable amplitude, selectable attack envelope, sustain/decay rate control, and frequency profile.



MusicSystem Instrument Definer Program.

Music Merger provides the capacity to merge two composition files. It also lets you copy composition files.

Music Player compiles the Music Editor Composition files and adds the instrument requirements generated by the Instrument Definer files to produce the final Player files. These files produce the final musical output to the stereo system.



Waveform plotting via Mountain Computer MusicSystem.

Mountain Computer provides a comprehensive operator's manual with the MusicSystem. Within its 130 pages are chapters on system operation, descriptions of all system programs, and an extensive section on background and theory.

The manual makes extensive use of step-by-step examples that introduce you to each of the four programs. The manual also includes a complete list of error messages and their causes. It also contains reference material that describes the

hardware, system file formats, and hardware control via your own software.

Applications

- Transcribing Sheet Music
- Sound Creator & Generator
- Digital Synthesizer
- Polyphonic Creator
- Sheet Music Printer
- Scientific Education
- Sound Effects
- Studio Sound Performance
- Research in Music
- Development of Intonation Theory
- Creating Music
- Historical Dance Reconstruction
- Vocal Accompaniment
- Background Music
- Emotional Music
- Entertainment
- Psychophysical Experimentation
- CAI for Music
- Commercial (T.V.) Music

Specifications

Musical Features

- 16 part digital synthesis, 8 parts per stereo channel.
- Waveforms, envelopes and amplitude are fully programmable for each of the 16 voices plus overall amplitude control.
- 32 kHz sample rate
- .5Hz step frequency resolution
- Graphic input of sheet music with standard musical notation using light pen paddles or keyboard.
- No programming experience is required to use the MusicSystem; ideal for the computer hobbyist, professional or amateur musician and children.

Hardware

- Dual Music Boards hardwired and ready to install. Each MusicSystem is fully tested.

- Photo-sensitive light pen for input and editing of musical data
- RCA-type standard audio output jacks for connection to stereo amplifier or headphones.
- All connecting cables are provided.
- Quick and simple installation is described in the Operating Manual.
- Contact: Syntauri Corporation
3506 Waverly Street
Palo Alto, CA 94306
(415) 494-1017
or: Passport Designs
785 Main Street, Suite E
Half Moon Bay,
CA, 94019
(415) 726-0280

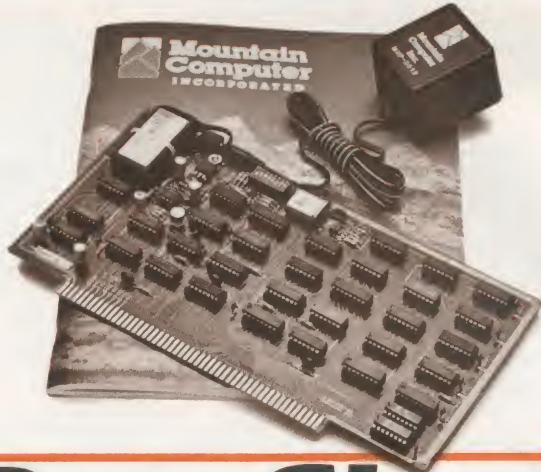
for possible real-time keyboards and educational software compatible with the MusicSystem.

Software

- Operating System designed especially for the MusicSystem
- Master diskette includes all software for the system ready to run; no compiling or modifications necessary.
- Music Editor, a full capability graphics editor for realistic input of musical data.
- Music Player, a special "run-time" processor of musical data allows you to choose instruments and spatial location each time a song is played.
- MusicSystem Operating Manual includes installation, a tutorial, full reference details, hardware description, theory of additive synthesis, etc.
- Hard copy musical score output through Apple Silentype printer.

Put your S-100 Bus Computer on the Clock.

For your S-100 bus computer, real time calendar and clock applications become simple and accurate. Provides real time and program time dependent functions for virtually any interval from 100 microseconds to 100,000 days. Real time interrupts, vectored or restart types are possible with the 100,000 Day Clock.



100,000 Day Clock

Features and Specifications

Ideal for making measurements, generating interrupts, and timing events. Time and date transaction printouts and date stamps are easily achieved. The 100,000 Day Clock can be used with most BASIC programs.

15 I/O ports for the time and 1 I/O port for interrupts allow you to assign the ports to any 16 ports on your 8080 or Z-80 computer through DIP switches. On-board battery backup and low power consumption of the 100,000 Day Clock mean that your clock will stay up for days . . . even if the power goes down. Crystal controlled accuracy of $\pm .001\%$ is also standard on the 100,000 Day Clock.

The operating manual contains complete instructions for operation including installation and setup. The Software section contains routines with listings for setting and reading the clock (including month, day and year). A detailed section on the hardware theory of operation, including a schematic, is also provided.

Specifications

- Utilizes 16 I/O ports of a Z-80 or 8080 system. User selectable with Dip Switches. 15 I/O ports for the time, one port for interrupt.
- Crystal Controlled Circuit for accurate time: $\pm .001\%$.
- Time in $100\mu\text{s}$ increments for periods up to 100,000 days (273 years).
- On-board NiCad battery to prevent time loss for up to 4 days with power off. Charges from computer bus.
- External battery charger included.
- A write protect switch prevents accidental changes in time.
- Software selectable interrupts for intervals of $100\mu\text{s}$, 1ms, 10ms . . . 1 sec, 10 sec, 1 min, . . . , 1 day, 10 days, . . . etc.
- Interrupts can be configured for restart addresses or for a vectored interrupt system.
- Digit transition information insures valid interpretation of time.
- One digit of time is read from each port. To set the time simply write the correct time to the ports.
- Software documentation includes calendar routines, and an interrupt handling package, as well as examples of reading and setting the time.



Real time for your Apple®.

The original real-time clock for the Apple II®, still unsurpassed for accuracy and quality. The Clock is easily accessed from BASIC using routines carried in on-board ROM, allowing you to read time and program time-dependent functions for virtually any interval. The only clock with milliseconds as well as day and month time stamps.

The Clock

Features and Specifications

Crystal-controlled accuracy of $\pm .001\%$, makes The Clock the most accurate timepiece for your Apple II. On-board battery backup keeps your clock in operation, even during power outages. Time in 1 millisecond increments for periods as long as one year is possible with The Clock. More software has been written for The Clock than any other peripheral board made for the Apple II. Program interrupts are, of course, standard. Software controlled interrupts are generated by The Clock which means you can call up schedules, time events, date printouts—all in real-time on a programmed schedule. Still the finest timepiece available for your Apple II.

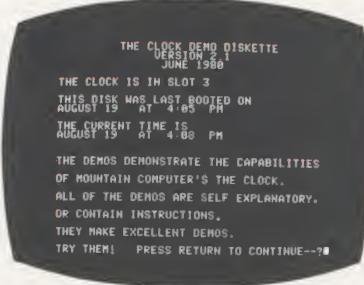
Extensive user documentation is supplied with The Clock. The Clock Operating Manual contains detailed instructions for card installation, setting the time, and reading the time. Integer BASIC and Applesoft BASIC program listings for setting and reading the time are also provided.

Specifications

- On-board ROM for easy access from BASIC or machine language. ROM provides month, day, hours, minutes, seconds, 1/10 second, 1/100 second, and 1/1000 second

to the user. Read the time with a simple INPUT statement.

- On-board NiCad battery to prevent time loss during computer off times, for up to 4 days with power off. Battery charges from Apple bus.
- External battery charger included. Provides power to The Clock when the computer is off.
- Crystal controlled circuit for accurate time: $\pm .001\%$.
- Software selectable 1 second interrupts. Other interrupts are hardware selectable. May be used with other boards that interrupt in the Apple.
- Applesoft program provided to set the time.
- Example programs supplied on diskette.
- A write protect switch prevents accidental changes in time.
- Clock needs only be set once every 388 days. Leap years are also accounted for.
- Documentation includes many examples or programs to use with your Apple® in any configuration. Programs include routines for measuring elapsed time, time intervals, as well as those for a standard calendar and clock.



The Clock demo software.

Applications

- Alarm Control
- Stopwatch
- Program Control
- Real-Time Readings from a Spectrometer in a Laboratory
- Time/Date Stamp
- Real-Time Data Acquisition and Control
- Event Timer
- Reports, Time Delays, Elapsed Events, etc.
- Timer for Real-Time Controls
- Time Business Programs
- Business (General Ledger, File Listings, etc.)
- Timing for Instrumentation
- Laboratory Experiments
- Process Time Cards
- Biological Research and Development
- Measure Interactive Response Time

Real world Interface for your Apple II®.

Super-fast conversion time permits high sample rate applications not possible with slower cards.

A/D + D/A is your answer for real world interface in commercial, scientific, and industrial data acquisition and control functions.



A/D+D/A

Features and Specifications

A/D + D/A is a single PC card allowing 16 channels of analog to digital input and 16 channels of digital to analog output. Incredibly fast 9 microsecond conversion time with full 8-bit resolution makes this the most desirable interface card for your Apple II®. In any application when linking your Apple II® to the outside world for accurate fast measurements or data acquisitions, A/D + D/A is the solution. Operating manual contains sample applications with schematics, part lists, and guides for easy start-up. Self-test diagnostic software is, of course, included.



A/D + D/A self-diagnostic software, included with the package.

A/D Features

- 16 input analog channels—software selectable on a READ com-

mand.

- Resolution is 8 binary bits (including sign bit).
- Conversion method—successive approximation.
- Conversion starts on a software READ command.
- Full scale and zero adjustments.

A/D Specifications

- DC Input impedance ≈ 1 meg. ohm.
- Analog input voltage— ± 5 volts maximum.
- Channel conversion time—9 microseconds.
- Accuracy
 - a. Absolute $\approx \pm 3\%$ FSR
 - b. Relative $\approx \pm 1$ LSB

D/A Features

- 16 output analog channels—software selectable on a WRITE command.
- Full scale and zero adjustments.

D/A Specifications

- Monotonic outputs.
- Analog output voltage— ± 5 volts maximum.
- Output current (source or sink) 2 millamps.
- Accuracy—

a. Absolute $\approx \pm 3\%$ FSR

b. Relative $\approx \pm 1$ LSB

- Output slew rate ≈ 10 volts/millisecond.
- Dynamic output impedance ≈ 10 ohms.

Applications

Environmental Sensing
Data Acquisition
Monitoring Device
Handicap Evaluator
Research Measurement
Imaging Output
Auto. Temperature Control
Satellite Ground Station Antenna
Tracking

Physiology Evaluation
Production of Noises, Data Input,
Production of Speech

Sailboat Design & Test
Digital Music Synthesis/Analysis
Stage Lighting Control
Scientific Instrumentation
Lab Instrumentation
Oil Field Monitoring
Ultrasonic Analog Input
Audio-Visual Automation
Engineering
Combustion Research
Biorhythm Research
Medical Waveform Analysis

For cable information see page 15.



Digital Speech is now a two-way street.

With a Supertalker installed in your Apple II® you will be able to digitize your speech and store it in memory. Supertalker can recall this stored information and convert it to audio for output to the speaker system.

Supertalker SD200

Features and Specifications

I/O capability allows interactive teaching programs and speech-prompted data input formats. Use output for speech directed activities in business systems, announcements in a control-room, or sound effects in entertainment programs. Application programs now available for use by educators with no programming experience. Teacher-chosen phrases can be input for later voice output in custom lessons for language arts and foreign vocabulary drills.

Supertalker includes a circuit card, microphone, loudspeaker, instruction manual, and software.



Menu-driven language practice and translations.



Voice-reinforced math training.

Specifications

- Human speech output under program control made easy with fully documented operating system software.
- Hardware includes SuperTalker Card, Loudspeaker, and Microphone for speech input.
- Four software selectable digitizing rates: .5 Kbyte/Sec.; 1 Kbyte/Sec.; 2 Kbyte/Sec.; 4 Kbyte/Sec. Speech output quality improves as rate is increased.
- Operating system software provides for storage of digitized speech on diskette.
- Data compression provides maximized storage on disk.
- Stores about 120 sec. real-time speech output at 2 Kbyte rate on one Apple II® diskette.
- Four software selectable settings

for output volume through speaker.

- On-board two watt audio amplifier to drive speaker provided, or output through a stereo or P.A. system.
- Frequency Response: Filtered to 300 Hz-3000 Hz human voice range for OUTSTANDING clarity.
- Ready-to-run programs, (Supplied) ACCENT, a talking language translator. COLOR MATH, a talking arithmetic game.
- VPS, Vocal Preparation System is the Operating System and Editor that leads you to the creation of your own talking programs.
- Available Separately: LISTEN 'N' LEARN, application program for educators—exercises in the language arts.

Applications

Voice Controlled Appliances
Seminar Demonstrations
Program Prompts
Classroom Instruction
Computer-aided Instruction
Talking Time-share Terminal with Modem
Educating Handicapped People
Teaching Math, Foreign Languages
Security Systems
Talking Clock Using "The Clock"
Speech Therapy
Computer Output for the Blind

The RS-232C DB25 Pin Reconfiguration Adapter.

The Mountain Computer Pin Reconfiguration Adapter enables the user to instantly mate almost any serial I/O device to a computer by rerouting the RS-232C signals. The PRA eliminates the task of fabricating special cables or resoldering existing cable wiring to achieve a signal interface between two units.



PRA

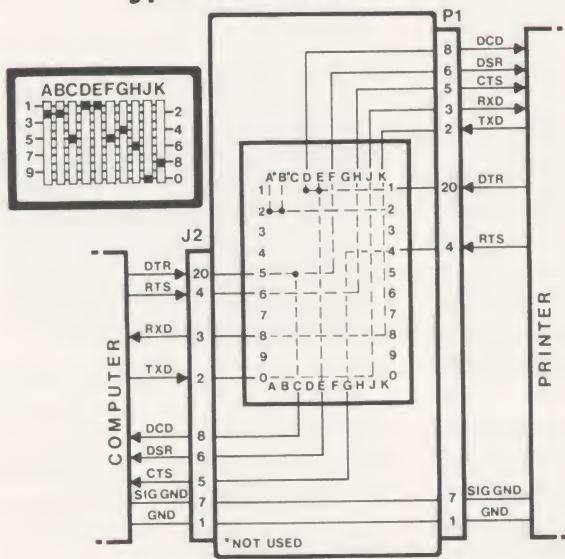
Features

The PRA can reconfigure to both full handshake and typical no handshake configurations. The PRA is the simple, logical solution to RS-232C reconfiguration needs.

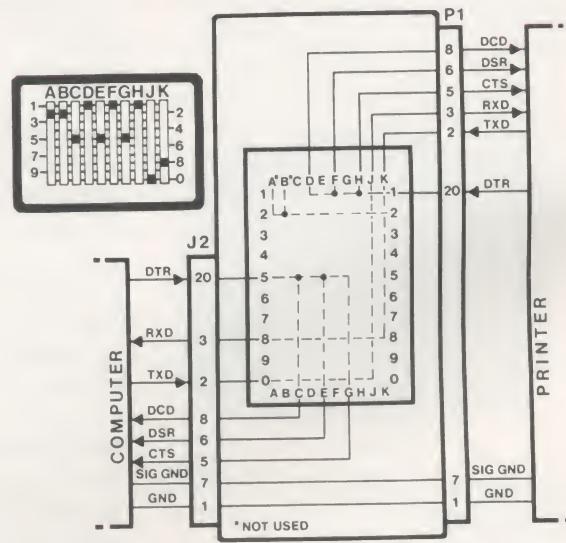
Adapter Interconnection Diagram



Typical Full Handshake



Typical No Handshake



Three unused jumper points (B, 2, and 3) are available for routing additional signals through the matrix switch. For additional signal handling, P1 pin 11 (unassigned) is also routed to the switch.

Disk Programs

For all of our CPS owners, the Z-80 Softcard and CPS PASCAL Diskettes are available and necessary for interfacing your CPS card to PASCAL or Z-80 based programs. A reminder too that "The Clock" PASCAL Diskettes are also necessary for interfacing The Clock to PASCAL based programs.

Blank Diskettes

Mountain Computer has always supplied diskettes and software with their cards and due to our large-volume buying, we have diskettes, unlabeled and in Mountain Computer jackets, available for purchase by our customers. Bulk orders of minimum orders of 100 diskettes are available and all of you needing high quality diskettes should take advantage of this unbelievable price —\$275.00 per 100 diskettes.

Ram Chips

Mountain Computer is in the chips! Special offering to our RAM card customers—eight 16K RAM chips for only \$24.95. Save yourself both time and money by ordering your RAM chips from Mountain Computer.

Prototyping Card

Mountain Computer has not forgotten the hard-core hobbyist. Mountain Computer's prototyping card for both the Apple II® and Apple III® is available for all of your custom work and design needs. This prototyping card allows you, the dedicated user, to custom design and wrap your own interface cards.

Cables

CPS Cables

Mountain Computer provides custom I/O cables for interfacing the CPS Multifunction Card to specific peripheral devices. Pinout information for each of these cables is

provided in the CPS Multifunction Hookup Guide. Each cable is six feet in length and connects to the following device:

DEVICE	CONNECTOR TYPE	I/O TYPE	MATES TO CPS CONNECTOR	MCI PART NUMBER
Modem	DB25 Male	Serial	J4	01-00156-01
Modem	DB25 Female	Serial	J4	01-00156-02
Ext. Cable	DB25 Male to Male	Serial	—	01-00213-01
IDS Printer	DB25 Female	Parallel	J5	01-00263-01
IDS Printer	DB25 Female	Serial	J4	01-00265-01
Epson Printer	Epson	Parallel	J5	01-00264-01
Centronics Printer	Epson	Parallel	J5	01-00264-01
Terminal	DB25 Male	Serial	J4	01-00266-01
Diablo Printer	DB25 Female	Serial	J4	01-00299-01
C ITOH Printer	DB25 Female	Serial	J4	01-00366-01

A/D+D/A Cables

Two 6 foot cables are available for connecting the A/D+D/A Card 16 channel analog input and output to the sending or receiving devices. System self test is easy, just connect both cables to the card and connect the DB25 connectors together. The 01-00156-01 cable provides an interface between the A/D+D/A card

and a DB25 Male connector. The 01-00156-02 provides an interface between the card and a DB25 Female connector. Both cables can be purchased as an assembly by ordering 01-00239-01. Either cable can be connected to the card input or output channels.

Card Reader

Mountain Computer is proud to announce our new auto feeding, mark-sense card reader that will interface to most computers with an RS-232C port. The card reader will be featured at COMDEX '81 and will be ready for delivery in February of 1982. Any and all ques-

tions regarding the availability, price, and capabilities of the Mountain Computer card reader should be directed to the Sales Department at Mountain Computer. Interest has been high and orders will be filled on a first received, first shipped basis.

PRODUCT NUMBERS (use when ordering)

NUMBER	PRODUCT NAME
01-00214-01	CPS Multifunction
01-00298-01	RAMPLUS+
01-00166-01	EXPANSION CHASSIS*
01-00166-02	EXPANSION CHASSIS (220V)*
01-00233-01	ROMPLUS+
01-00236-01	ROMWRITER
01-00227-01	MusicSystem
01-00228-01	100,000 DAY CLOCK*
01-00229-01	THE CLOCK
01-00230-01	A/D + D/A
01-00231-01	SUPERTALKER SD200
01-00234-01	KEYBOARD FILTER ROM ¹ *
01-00235-01	COPYROM ¹ *
01-00232-01	INTROL/X-10
01-00353-01	CARD READER ²
01-00360-01	CPS Multifunction PASCAL DISKETTE
01-00317-01	CPS Multifunction Z-80 SOFTCARD DISKETTE
01-00363-01	THE CLOCK PASCAL DISKETTE

The above includes manuals (and diskettes unless asterisked*).

INTERFACE ACCESSORIES

01-00243-01	RS232 PIN RECONFIGURATION ADAPTER (Matrix switch unit allows RS232 lines to be rerouted without soldering)
CPS I/O Cables (6' long)	
01-00156-01	MODEMS—SERIAL TO DB25 MALE
01-00156-02	SERIAL TO DB25 FEMALE (Pinout the same as 01-00156-01)
01-00213-01	DB25 MALE TO DB25 MALE
01-00263-01	IDS PRINTERS—PARALLEL TO DB25 . EMALE
01-00264-01	EPSON/CENTRONICS—PARALLEL TO CENTRONICS TYPE CONNECTOR
01-00265-01	IDS PRINTER—SERIAL TO DB25 FEMALE
01-00266-01	TERMINALS (i.e. Hazeltline) SERIAL TO DB25 MALE
01-00299-01	DIABLO TERMINAL, SERIAL PRINTER, SERIAL TO DB25 FEMALE
01-00366-01	C ITOH PRINTERS—SERIAL TO DB25 FEMALE

A/D + D/A I/O Cables (6' long)

01-00156-01	A/D + D/A HEADER TO DB25 MALE
01-00156-02	A/D + D/A HEADER TO DB25 FEMALE
01-00239-01	I/O CABLE ASSEMBLY ³

MISCELLANEOUS

01-00240-01	EXTERNAL CHARGER
01-00241-01	TTL CONNECTOR ⁴
01-00242-01	PROTOTYPING CARD—Apple III [®] (Apple II [®] if lid removed)

SOFTWARE SUPPORT (16 Sector Diskettes)⁵

12-00215-XX	CPS Multifunction BASIC DISKETTE
12-00193-XX	CPS Multifunction PASCAL DISKETTE
12-00194-XX	CPS Multifunction Z-80 SOFTCARD DISKETTE
12-00349-XX	RAMPLUS+ DISKETTE
12-00249-XX	ROMWRITER DISKETTE
12-00250-XX	MusicSystem DISKETTE SET
12-00245-XX	THE CLOCK DISKETTE
12-00244-XX	THE CLOCK PASCAL DISKETTE
12-00251-XX	A/D + D/A DISKETTE
12-00246-XX	SUPERTALKER SD200 DISKETTE
12-00247-XX	KEYBOARD FILTER DISKETTE (Requires Romplus+)
12-00248-XX	INTROL/X-10 DISKETTE
12-00253-XX	DEMO PROGRAMS, Free Running

OPERATING MANUALS

11-00214-XX	CPS Multifunction
11-00317-XX	CPS Multifunction PASCAL
11-00360-XX	CPS Multifunction Z-80 SOFTCARD
11-00298-XX	RAMPLUS+
11-00166-XX	EXPANSION CHASSIS
11-00233-XX	ROMPLUS+
11-00236-XX	ROMWRITER
11-00227-XX	MusicSystem
11-00228-XX	100,000 DAY CLOCK
11-00229-XX	THE CLOCK
11-00363-XX	THE CLOCK PASCAL
11-00230-XX	A/D + D/A
11-00231-XX	SUPERTALKER SD200
11-00234-XX	KEYBOARD FILTER ROM
11-00235-XX	COPYROM
11-00232-XX	INTROL/X-10
28-00214-XX	CPS MULTIFUNCTION PERIPHERAL DEVICE HOOK-UP GUIDE
11-00353-XX	CARDREADER

SUPPLIES

26-00254-01	APPLE BASIC PROGRAMMING CARDS ⁶
26-00255-01	MULTICHOICE TEST ANSWER CARDS ⁶
12-00271-01	BLANK DISKETTES (package of 100)
01-00364-01	16K RAM CHIPS (package of 8)

¹ Rom Chip and manual only. Will work only when installed on Romplus+ board.

² Available February 1982.

³ Consists of 2 cables. One 01-00156-01 and one 01-00156-02. Can be connected together to use A/D + D/A selftest software.

⁴ Connector and cable to attach to Romplus+ TTL inputs. Provides for Keyboard Filter "shift key" modification.

⁵ If you need a 13 sector diskette see your dealer or contact Mountain Computer Customer Services.

⁶ For use with Card Reader 01-00238-01 (Discontinued Product).

Apple II and Apple III are registered trademarks of Apple Computer, Inc.

Z-80 Softcard is a registered trademark of Microsoft, Inc.

Due to continuing research and development activities leading to potential product changes, prices and specifications are subject to change without notice.

**Limited Warranty for Mountain Computer Inc.
Peripheral P.C. Boards**

Your factory-built Mountain Computer Inc. product is warranted against defects in materials and workmanship for a period of one year from the date of delivery. We will repair or replace products that prove to be defective during the warranty period, provided they are returned to Mountain Computer Inc. No other warranty is expressed or implied. We reserve the right to refuse to repair any product that, in our opinion, has been subjected to abnormal electrical or mechanical abuse. Products less than two years out of warranty will be repaired for a nominal flat fee. Before sending your Mountain Computer Inc. unit in for repair, contact our Customer Service Representative for a Return Authorization Number.

Limited Warranty for Mountain Computer Inc. Software

Computer software programs cannot replace your sound business judgement or make decisions for you. You, therefore, assume complete responsibility for any decisions made or actions taken based on information obtained using Mountain Computer Inc. software programs and instructional materials.

Mountain Computer Inc. software and the attached instructional material are sold "AS IS," without warranty as to their performance. The entire risk as to the quality and performance of the computer is assumed by you.

However, to the original purchaser only, Mountain Computer Inc. warrants the software diskette or cassette to be free from defects in materials and faulty workmanship under normal use and service for a period of one (1) year from the date of purchase. If, during this one year period, a defect in the diskette or cassette should occur, it may be returned to Mountain Computer Inc. or an authorized Mountain Computer Inc. dealer for replacement of the cassette or diskette without charge to you. Your sole and exclusive remedy in the event of a defect is expressly limited to replacement of the diskette or cassette as provided above.

If the failure of the diskette or cassette, in the judgement of Mountain Computer Inc. resulted from accident, abuse or misapplication of the diskette or cassette, then Mountain Computer Inc. shall have no responsibility to replace the diskette or cassette under the terms of this warranty. In such an event, replacement of the diskette or cassette is available to the original purchaser at a nominal charge.

The above warranties for goods are in lieu of all warranties, express, implied or statutory, including, but not limited to, any implied warranties of merchantability and fitness for a particular purpose, and of any other warranty obligation on the part of Mountain Computer Inc. In no event shall Mountain Computer Inc. or anyone else who has been involved in the creation and production of this product be liable for indirect, special or consequential damages, such as, but not limited to, loss of anticipated profits or benefits resulting from the use of this product, or arising out of any breach of this warranty. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

